



## INTEROFFICE CORRESPONDENCE

DATE: October 12, 1994

TO: L. A. Collins, Solar Pond Projects, Bldg. 080, X6968

FROM: E. H. Wilson, Solar Pond Projects, Bldg. 080, X6952

*E.H. Wilson*

SUBJECT: WP 12189-SELECTION OF INVESTIGATION DERIVED MATERIALS (IDM) SOIL SAMPLES IN DRUMS IN TENT SIX ON 750 PAD FROM PHASE I RFI/RI BOREHOLES EHW0394 - EHW-010-94

DOE Order: 4700.1

Action: None required

**Purpose:**

This paper develops the rationale for screening and obtaining representative investigation derived materials (IDM) soils produced as part of the 1993 Phase 1 RFI/RI Solar Pond field investigations. Subcontractors under the Treatability Testing program will test these samples. The Treatability Study testing programs will require approximately 5000 lbs of material.

**Procedure:**

Sample selection involves two steps. Step One screens all 145 IDM drums described in the in Attachment A. The screening process uses the criteria described below. This step establishes sets of representative drums. Step Two is the actual drum selection of primary candidate drums. This assumes that all drums are equally available.

**Step One-Drum Screening Process** - Step One defines the sets of drums that must be randomly sampled. Sample selection criteria are shown below. The first criterion is to identify the source boreholes for the drummed IDM soils. Additional sample screening criteria further define the sample sets. The boreholes are the source of the IDM soils. This study utilized the borehole locations shown Figure One Sample Area and Borehole Locations. All the IDM drums in Table One are from the Phase One RFI/RI boreholes. The most important screening criteria are the six borehole sample area subdivisions and depth of estimated contamination. These criteria coincide to define the most likely excavation conditions. The second set of candidate screened drums shall be those screened for depth. The shallowest four drums from each borehole are those that were filled during the first day or two of drilling (Table Two).

- Borehole Sampling Areas - The following areas are subdivisions of the overall OU-4 area within the boundary shown in Figure One:
  - Area I-and II- Contaminated soils on the hillside north of the Solar Ponds
  - Area III-Solar Ponds A, B, and C
  - Area IV- South of Pond C
  - Area V- East of Pond A
  - Area VI-South of Pond B
- The IDM drummed materials are typical of the types of contaminated materials within the Solar Ponds areas (see Table One).

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- Depth limitation - The upper 20 ft in any given borehole shall be considered for analysis and testing. This implies that potential contamination is present to approximately an average 10 ft depth.
- One 30 gallon drum contains approximately 301 lbs of borehole cuttings (see calculations in Attachment C). This is approximately equivalent to 4 to 6 ft of borehole advanced by hollow stem auger methods.
- Date of IDM Placement in a Drum- Assume that the earliest drum generation date coincides with the shallowest borehole IDM generation date.
- All drums are equally accessible in Tent Six on Pad 750.
- The proportion of IDM drums is not indicative of the quantities of potential contaminated materials present in the Solar Ponds Areas.
- The shallowest IDM soils shall be assumed to be the first in the drum series shown.

**Required Number of Drums** - The total sample weight required for testing is 5000 lbs. This is equivalent to 17 drums if average drum weight is 301 lbs. (see Attachment C). A total of 129 drums fulfill these criteria. See Table Three for a summary by Sample Area. The drums that fulfill these criteria are shown without an asterisk in both Tables One and Two.

**Step Two-Drum Selection Process** - Step Two is the actual selection of the representative drums from each of six sample sets established in Step One. Table Four identifies this set of drums. Next, each drum within each sample area was correlated by a random number obtained from a probability and statistics table of random numbers (see attachment B). The random numbers then were sorted in ascending order to determine the final selection sequence for primary and alternate candidate IDM drums. Table Five shows the unsorted sequence of drums. Tables Six through Eleven show the ascending sorted order of candidate drums for each Sample Area I through VI. The estimated volume of contaminated soil present in OU-4 is the final criterion for determining quantity of drums from each sample area. Geometry, dimensions and depth of estimated contamination within each Sample area determine the proportion of representative soil samples. This estimated soil volume ratio shall determine how many IDM drums shall represent that Sample Area. Calculations are shown in Attachment C.

Sample Area	Estimated Average Depth (ft)	Area (ft <sup>2</sup> )	Volume (ft <sup>3</sup> )	Per Cent	Number of Drums Required
I	1	377,500	377,500	6	1
II	2	460,000	920,000	16	3
III	10	441,000	4,410,000	75	13
IV	1	45,000	45,000	1	0
V OU-6?	0	406,400	0	0	0
VI	1	90,000	90,000	2	0
Total Volume			5,842,500	100	17

Notes:

This calculation is an estimate for 216,389 C.Y. of contaminated soil.  
Unit Dry Weight of Soil is 100pcf.  
Drums are 75 % full and weigh 301 lbs each.  
Sample Mass Required is 5000 lbs.

## Results

Tables Six, Seven, Eight and Nine are used to make the final drum selection. Sample Area I-The first and only drum selected for Sample Area I in Table Six is #2882 from Borehole 40393 at depth range of 5-10 ft. This borehole is adjacent to the perimeter Road in the middle of Sample Area I. Another drum can be selected for this sample area since contamination is typically no more than 6 inches deep. This drum is typical of the material that is in Sample Area I because the subsurface drainage trench is to be excavated to depths of 10 to 15 ft. The next shallowest drum sample selection is drum #2689 in borehole 44993 at depth of 0-5 ft.

Sample Area II - The first three drums in Table Seven from Sample Area II are 3126, 2901 and 3094 from boreholes 46293, 42693 and 45893 respectively. These three boreholes are in the center part of the Hillside is Sample Area II and are representative of the shallow hillside excavation conditions.

Drum	Borehole	Depth Range (ft)
3126	46293	0-5
2901	42693	0-5
3094	45893	5-10

Sample Area III - The first 13 drums summarized below are from Table Eight. These drums are representative of the anticipated excavation depths and conditions beneath the Solar Ponds.

Drum	Borehole	Depth Range (ft)
3073	40993	10-15
3149	41593	5-10
3230	43493	0-5
2606	42993	0-5
3128	43693	15-20
2987	41693	5-10
2603	42093	5-10
2702	46793	0-5
2902	43893	0-5
3117	42193	5-10
2992	43793	10-15
2936	43793	0-5
3152	41583	15-20

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**Conclusions:**

Representative and random sampling of the varied contaminated soil and anticipated excavation conditions resulted in the selection of 17 IDM drums. Estimates of the contaminated soil volume within each Sample Area that may be excavated and placed beneath the cell cap were used to determine the appropriate ratio of samples. The only remaining unknown is the availability of these identified drums in Tent Six on the 750 Pad. For this condition I propose that the next drum on the appropriate table be selected until a complete set of 17 drums has been removed from Tent Six. This option will reduce the need to completely disassemble the entire collection of 145 drums that are strapped together four to a wooden pallet and stacked three pallets high.

jlb

Attachment:  
As Stated

cc:  
T. d. Beckman  
T. D. Schmidt  
File  
ERPD Records (2)

4142

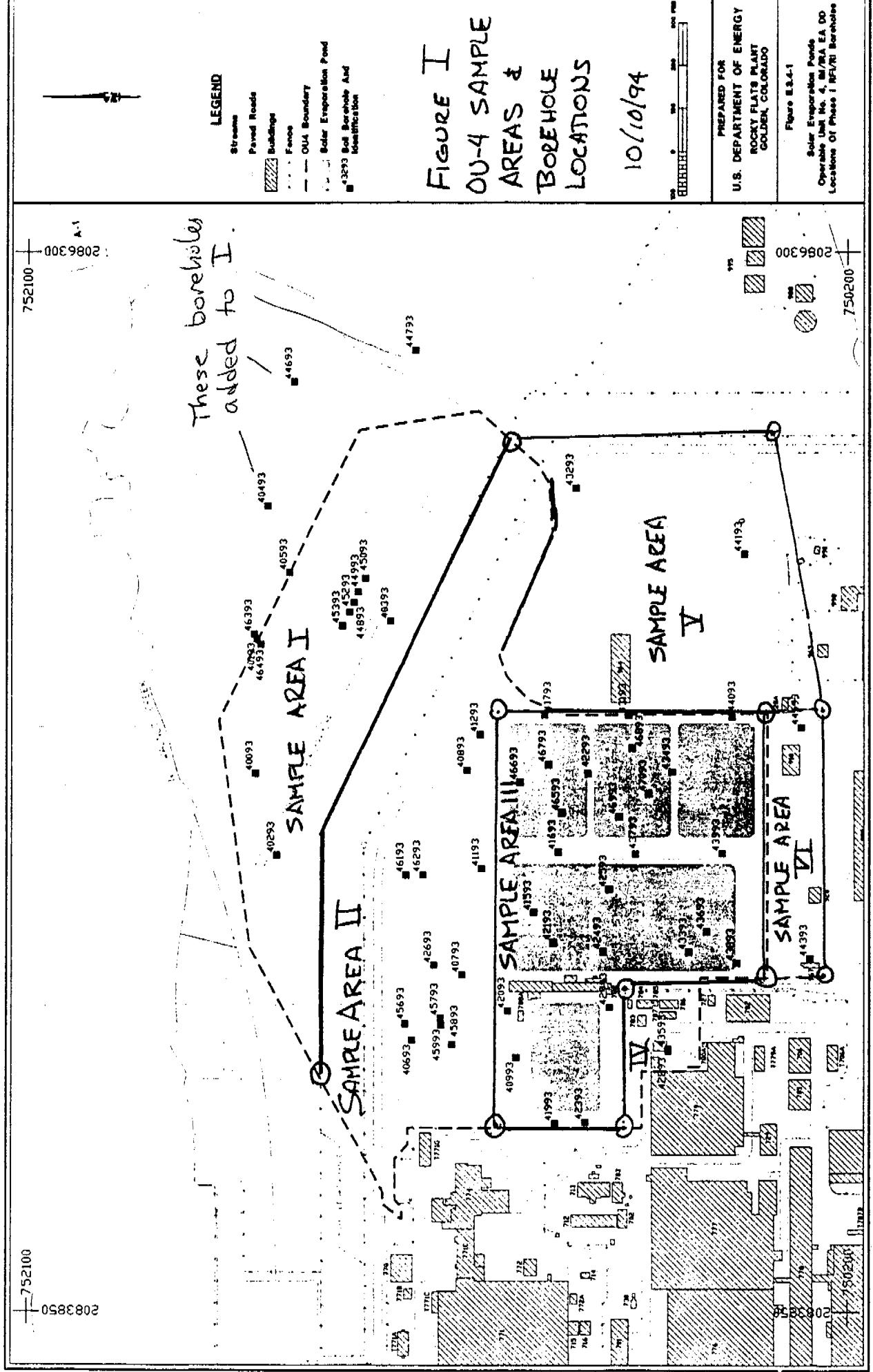
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**Figure One**  
**OU-4 Sample Areas and Borehole Locations**

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**Table One**  
**All Boreholes and Drummed Investigated Material (IDM) from the Solar Ponds Areas**  
**Arranged By Borehole Number**

BOREHOLE	LOCATION	DRUMS	DATE
40093	AREA I	2630,2631,2645	1/13/93
40193	AREA I	2590,2591,2592,2614; 2618*	1/6/94; 1/7/94
40293	AREA I	2701	1/20/93
40393	AREA I	2881,2882,2897	1/29/94
40493	AREA I	2621	1/8/93
40593	AREA I	2703,2704; 2692,2879,2880*	1/26/93; 1/27/93
40693	AREA II	2990	2/26/93
40793	AREA II	3043,3044	3/2/93
40893	AREA II	2504,2518	12/15/92
40993	AREA III-C	3071,3072,3073,3074,3077*,3078*	3/5/93
41093	X	none	
41193	AREA II	2716,2899	1/28/93
41293	AREA II	2988	2/24/93
41393	X	none	
41493	X	none	
41593	AREA III	3129,3149,3151,3152	2/22/93
41693	AREA III	2935,2987,2989; 2993	2/22/93; 2/23/93
41793	AREA III-	2985,2986	2/22/93
41893	AREA III-C	none	
41993	AREA III-C	2605; 2604,2607; 2666*	1/13/94; 1/14/93; 1/19/93
42093	AREA III-C	2602; 2603	1/8/93; 1/12/93
42193	AREA III	3106; 3116,3117; 3120;3121*; 3145*,3146*,3147*,3147*,3150*	3/19/93; 3/22/93; 3/24/93; 3/31/93
42293	AREA III	3233	4/16/93
42393	AREA III-C	2713,2715	1/27/93
42493	AREA III	3122; 3123; 3114	3/22/93; 3/23/93; 3/24/93
42593	AREA III	3079,3080; 3081,3082,3083*,3084*	3/16/93; 3/17/93
42693	?	2901;	2/3/93
42793	X	none	
42893	AREA IV-787	3091,3092	3/11/93
42993	AREA III-C	2606,2667,2668; 2714	1/20/93; 1/25/93
43093	X	none	
43193	AREA III-A	2931,2934	2/18/93

**Table One con't**  
**All Boreholes and Drummed Investigated Material (IDM) from the Solar Ponds Areas**  
Arranged By Borehole Number

43293	AREA V	2900,2903; 2904	1/29/93; 2/2/93
43393	AREA III	3104,3105	3/18/93
43493	AREA III	3230	4/21/93
43593	AREA IV-787	2717,2718; 2719	1/26/93; 1/27/93
43693	AREA III	3115,3118; 3119; 3128	3/24/93; 3/25/93; 3/26/93
43793	AREA III	2936,2991; 2992	2/24/93; 2/25/93
43893	AREA III	2902; 2720,2938	2/5/93; 2/8/93;
43993	AREA III	2940; 2941; 2942	2/11/93; 2/18/93; 2/10/93
44093	AREA III	2939,2898	2/10/93
44193	AREA V	2519; 2520,2549,2521,2546,2547*,2548*,:; 2578*,2579*,2580*,2581*; 3153*,3154*; 3155*,3156*,3157*,3160*	1/5/93; 1/6/93; 1/6/93; 3/30/93; 3/31/93
44293	AREA III	none	
44393	AREA VI	2943,2944,2945	2/8/93
44493	X	none	
44593	AREA VI	none	
44693	AREA I	2577	1/5/93
44793	AREA I	2619,2620	1/12/93
44893	AREA I	2648,2657,2658,2662	1/15/93
44993	AREA I	2689,2690; 2691	1/19/93; 1/20/93
45093	AREA I	3165,3166	4/5/93
45193	X	none	
45293	AREA I	2662,2663,2664,2665	1/18/93
45393	AREA I	3167,3168	4/5/93
45493	X	none	
45593	X	none	
45693	AREA II	3113	3/19/93
45793	AREA II	3112	3/18/93
45893	AREA II	3093,3094; 3103	3/16/93; 3/17/93
45993	AREA II	none	
46093	X	none	
46193	AREA II	3124; 3125	3/23/93; 3/24/93
46293	AREA II	3126,3127	3/25/93
46393	AREA I	none	

**Table One con't**  
**All Boreholes and Drummed Investigated Material (IDM) from the Solar Ponds Areas**  
**Arranged By Borehole Number**

46493	AREA I	none	
46593	AREA III	none?4277	11/6/93
46693	AREA III	none?4248	11/9/93
46793	AREA III	2702	1/26/93
46893	AREA III	none	
46993	AREA III	none	
47093	AREA III	4268	11/17/93

\* means that this drum is initially screened from sample selection process based on depth criterion.

**Table Two**  
**All Boreholes and Drummed Investigated Material (IDM) from the Solar Ponds Areas**  
**Arranged By Sample Area**

LOCATION	Borehole	DRUMS	DATE
AREA I	40093	2630,2631,2645	1/13/93
AREA I	40193	2590,2591,2592,2614; 2618*	1/6/94; 1/7/94
AREA I	40293	2701	1/20/93
AREA I	40393	2881,2882,2897	1/29/94
AREA I	40493	2621	1/8/93
AREA I	40593	2703,2704; 2692,2879,2880*	1/26/93; 1/27/93
AREA I	44693	2577	1/5/93
AREA I	44793	2619,2620	1/12/93
AREA I	44893	2648,2657,2658,2662	1/15/93
AREA I	44993	2689,2690; 2691	1/19/93; 1/20/93
AREA I	45093	3165,3166	4/5/93
AREA I	45293	2662,2663,2664,2665	1/18/93
AREA I	45393	3167,3168	4/5/93
AREA I	46393	none	
AREA I	46493	none	
AREA II	40693	2990	2/26/93
AREA II	40793	3043,3044	3/2/93
AREA II	40893	2504,2518	12/15/92
AREA II	41193	2716,2899	1/28/93
AREA II	41293	2988	2/24/93
AREA II	42693	2901;	2/3/93
AREA II	45693	3113	3/19/93
AREA II	45793	3112	3/18/93
AREA II	45893	3093,3094; 3103	3/16/93; 3/17/93
AREA II	45993	none	
AREA II	46193	3124; 3125	3/23/93; 3/24/93
AREA II	46293	3126,3127	3/25/93
AREA III-C	40993	3071,3072,3073,3074,3077*,3078*	3/5/93
AREA III	41593	3129,3149,3151,3152	2/22/93
AREA III	41693	2935,2987,2989; 2993	2/22/93; 2/23/93
AREA III-	41793	2985,2986	2/22/93
AREA III-C	41893	none	
AREA III-C	41993	2605; 2604,2607; 2666*	1/13/94; 1/14/93; 1/19/93
AREA III-C	42093	2602; 2603	1/8/93; 1/12/93

**Table Two con't**  
**All Boreholes and Drummed Investigated Material (IDM) from the Solar Ponds Areas**  
Arranged By Sample Area

AREA III	42193	3106; 3116,3117; 3120;3121*; 3145*,3146*,3147*,3147*,3150*	3/19/93; 3/22/93; 3/24/93; 3/31/93
AREA III	42293	3233	4/16/93
AREA III-C	42393	2713,2715	1/27/93
AREA III	42493	3122; 3123; 3114	3/22/93; 3/23/93; 3/24/93
AREA III	42593	3079,3080; 3081,3082,3083*,3084*	3/16/93; 3/17/93
AREA III-C	42993	2606,2667,2668; 2714	1/20/93; 1/25/93
AREA III	43193	2931,2934	2/18/93
AREA III	43393	3104,3105	3/18/93
AREA III	43493	3230	4/21/93
AREA III	43693	3115,3118; 3119; 3128	3/24/93; 3/25/93; 3/26/93
AREA III	43793	2936,2991; 2992	2/24/93; 2/25/93
AREA III	43893	2902; 2720,2938	2/5/93; 2/8/93;
AREA III	43993	2940; 2941; 2942	2/11/93; 2/18/93; 2/10/93
AREA III	44093	2939,2898	2/10/93
AREA III	44293	none	
AREA III	46593	none?4277	11/6/93
AREA III	46693	none?4248	11/9/93
AREA III	46793	2702	1/26/93
AREA III	46893	none	
AREA III	46993	none	
AREA III	47093	4268	11/17/93
AREA IV-787	42893	3091,3092	3/11/93
AREA IV-787	43593	2717,2718; 2719	1/26/93; 1/27/93
AREA V	43293	2900,2903; 2904	1/29/93; 2/2/93
AREA V	44193	2519; 2520,2549,2521,2546,2547*,2548*;; 2578*,2579*,2580*,2581*; 3153*,3154*; 3155*,3156*,3157*,3160*	1/5/93; 1/6/93; 1/6/93; 3/30/93; 3/31/93
AREA VI	44393	2943,2944,2945	2/8/93
AREA VI	44593	none	
X	41093	none	
X	41393	none	
X	41493	none	

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**Table Two con't**

**All Boreholes and Drummed Investigated Material (IDM) from the Solar Ponds Areas**

Arranged By Sample Area

X	42793	none	
X	43093	none	
X	44493	none	
X	45193	none	
X	45493	none	
X	45593	none	
X	46093	none	

- means that this drum is initially screened from sample selection process based on depth criterion.

**Table Three**  
**Summary of Screened of Number of Drums**

SAMPLE AREA	No of Boreholes	Total No. of Screened Drums Available
I	15	34
II	12	18
III	26	62
IV	2	5
V	2	7
VI	1	3
TOTAL	58	129

**Table Four**  
**Screened**  
**Drummed Investigated Material (IDM) from the Solar Ponds Areas**  
**Arranged By Sample Area**

LOCATION	Borehole	DRUMS	DATE
AREA I	40093	2630,2631,2645	1/13/93
AREA I	40193	2590,2591,2592,2614;	1/6/94;
AREA I	40293	2701	1/20/93
AREA I	40393	2881,2882,2897	1/29/94
AREA I	40493	2621	1/8/93
AREA I	40593	2703,2704; 2692,2879,	1/26/93; 1/27/93
AREA I	44693	2577	1/5/93
AREA I	44793	2619,2620	1/12/93
AREA I	44893	2648,2657,2658,2662	1/15/93
AREA I	44993	2689,2690; 2691	1/19/93; 1/20/93
AREA I	45093	3165,3166	4/5/93
AREA I	45293	2662,2663,2664,2665	1/18/93
AREA I	45393	3167,3168	4/5/93
AREA II	40693	2990	2/26/93
AREA II	40793	3043,3044	3/2/93
AREA II	40893	2504,2518	12/15/92
AREA II	41193	2716,2899	1/28/93
AREA II	41293	2988	2/24/93
AREA II	42693	2901;	2/3/93
AREA II	45693	3113	3/19/93
AREA II	45793	3112	3/18/93
AREA II	45893	3093,3094; 3103	3/16/93; 3/17/93
AREA II	46193	3124; 3125	3/23/93; 3/24/93
AREA II	46293	3126,3127	3/25/93
AREA III-C	40993	3071,3072,3073,3074,	3/5/93
AREA III	41593	3129,3149,3151,3152	2/22/93
AREA III	41693	2935,2987,2989; 2993	2/22/93; 2/23/93
AREA III-	41793	2985,2986	2/22/93
AREA III-C	41993	2605; 2604,2607; 2666	1/13/94; 1/14/93; 1/19/93
AREA III-C	42093	2602; 2603	1/8/93; 1/12/93
AREA III	42193	3106; 3116,3117; 3120;	3/19/93; 3/22/93; 3/24/93;
AREA III	42293	3233	4/16/93
AREA III-C	42393	2713,2715	1/27/93

Table Four con't

ScreenedDrummed Investigated Material (IDM) from the Solar Ponds Areas

Arranged By Sample Area

AREA III	42493	3122; 3123; 3114	3/22/93; 3/23/93; 3/24/93
AREA III	42593	3079,3080; 3081,3082,	3/16/93; 3/17/93
AREA III-C	42993	2606,2667,2668; 2714	1/20/93; 1/25/93
AREA III	43193	2931,2934	2/18/93
AREA III	43393	3104,3105	3/18/93
AREA III	43493	3230	4/21/93
AREA III	43693	3115,3118; 3119; 3128	3/24/93; 3/25/93; 3/26/93
AREA III	43793	2936,2991; 2992	2/24/93; 2/25/93
AREA III	43893	2902; 2720,2938	2/5/93; 2/8/93;
AREA III	43993	2940; 2941; 2942	2/11/93; 2/18/93; 2/10/93
AREA III	44093	2939,2898	2/10/93
AREA III	46593	none?4277	11/6/93
AREA III	46693	none?4248	11/9/93
AREA III	46793	2702	1/26/93
AREA III	47093	4268	11/17/93
AREA IV-787	42893	3091,3092	3/11/93
AREA IV-787	43593	2717,2718; 2719	1/26/93; 1/27/93
AREA V	43293	2900,2903; 2904	1/29/93; 2/2/93
AREA V	44193	2519; 2520,2549,2521,2546,	1/5/93; 1/6/93;
AREA VI	44393	2943,2944,2945	2/8/93

**Table Five**  
**Randomly Selected**  
**Drummed Investigated Material (IDM) from the Solar Ponds Areas**  
**Arranged By Sample Area**

ITEM	RANDOM NUMBER	LOCATION	BOREHOLE	DRUMS
1	878	AREA I	40093	2630
2	564	AREA I	40093	2631
3	287	AREA I	40093	2645
4	484	AREA I	40193	2591
5	186	AREA I	40193	2592
6	288	AREA I	40193	2614
7	358	AREA I	40193	2590
8	924	AREA I	40293	2701
9	298	AREA I	40393	2881
10	62	AREA I	40393	2882
11	724	AREA I	40393	2897
12	506	AREA I	40493	2621
13	544	AREA I	40593	2704
14	112	AREA I	40593	2879
15	166	AREA I	40593	2703
16	359	AREA I	40593	2692
17	155	AREA I	44693	2577
18	633	AREA I	44793	2619
19	819	AREA I	44793	2620
20	966	AREA I	44893	2662
21	312	AREA I	44893	2648
22	778	AREA I	44893	2657
23	67	AREA I	44893	2658
24	464	AREA I	44993	2690
25	265	AREA I	44993	2689
26	317	AREA I	44993	2691
27	591	AREA I	45093	3165
28	295	AREA I	45093	3166
29	845	AREA I	45293	2665
30	481	AREA I	45293	2663
31	666	AREA I	45293	2662
32	160	AREA I	45293	2664
33	226	AREA I	45393	3168
34	554	AREA I	45393	3167

**Table Five con't**  
**Randomly Selected**  
**Drummed Investigated Material (IDM) from the Solar Ponds Areas**  
**Arranged By Sample Area**

Item	Random Number	Area	Borehole	Drum Number
35	602	AREA II	40693	2990
36	904	AREA II	40793	3043
37	241	AREA II	40793	3044
38	638	AREA II	40893	2504
39	612	AREA II	40893	2518
40	318	AREA II	41193	2716
41	263	AREA II	41193	2899
42	446	AREA II	41293	2988
43	145	AREA II	42693	2901
44	198	AREA II	45693	3113
45	342	AREA II	45793	3112
46	923	AREA II	45893	3093
47	151	AREA II	45893	3094
48	471	AREA II	45893	3103
49	520	AREA II	46193	3124
50	887	AREA II	46193	3125
51	12	AREA II	46293	3126
52	644	AREA II	46293	3127

**Table Five con't**  
**Randomly Selected**  
**Drummed Investigated Material (IDM) from the Solar Ponds Areas**  
**Arranged By Sample Area**

Item	Random Number	Area	Borehole	Drum Number
53	0	AREA III-C	40993	3073
54	353	AREA III-C	40993	3071
55	393	AREA III-C	40993	3074
56	595	AREA III-C	40993	3072
57	1	AREA III	41593	3149
58	163	AREA III	41593	3152
59	233	AREA III	41593	3151
60	647	AREA III	41593	3129
61	81	AREA III	41693	2987
62	184	AREA III	41693	2989
63	574	AREA III	41693	2935
64	901	AREA III	41693	2993
65	203	AREA III-	41793	2986
66	959	AREA III-	41793	2985
67	238	AREA III-C	41993	2604
68	475	AREA III-C	41993	2607
69	626	AREA III-C	41993	2666
70	716	AREA III-C	41993	2605
71	95	AREA III-C	42093	2603
72	255	AREA III-C	42093	2602
73	124	AREA III	42193	3117
74	738	AREA III	42193	3106
75	796	AREA III	42193	3116
76	942	AREA III	42193	3120
77	442	AREA III	42293	3233
78	207	AREA III-C	42393	2713
79	428	AREA III-C	42393	2715
80	373	AREA III	42493	3122
81	471	AREA III	42493	3123
82	704	AREA III	42493	3114
83	543	AREA III	42593	3081
84	607	AREA III	42593	3082
85	645	AREA III	42593	3079
86	662	AREA III	42593	3080
87	45	AREA III-C	42993	2606
88	406	AREA III-C	42993	2714
89	571	AREA III-C	42993	2667
90	687	AREA III-C	42993	2668
91	284	AREA III	43193	2934
92	601	AREA III	43193	2931
93	286	AREA III	43393	3105
94	672	AREA III	43393	3104
95	4	AREA III	43493	3230
96	53	AREA III	43693	3128

**Table Five con't**  
**Randomly Selected**  
**Drummed Investigated Material (IDM) from the Solar Ponds Areas**  
**Arranged By Sample Area**

97	480	AREA III	43693	3119
98	566	AREA III	43693	3118
99	648	AREA III	43693	3115
100	125	AREA III	43793	2992
101	155	AREA III	43793	2936
102	264	AREA III	43793	2991
103	116	AREA III	43893	2902
104	847	AREA III	43893	2720
105	983	AREA III	43893	2938
106	531	AREA III	43993	2940
107	675	AREA III	43993	2941
108	840	AREA III	43993	2942
109	472	AREA III	44093	2939
110	496	AREA III	44093	2898
111	749	AREA III	46593	none?4277
112	533	AREA III	46693	none?4248
113	107	AREA III	46793	2702
114	339	AREA III	47093	4268

Item	Random Number	Area	Borehole	Drum Number
115	700	AREA IV-787	42893	3091
116	505	AREA IV-787	42893	3092
117	629	AREA IV-787	43593	2717
118	379	AREA IV-787	43593	2718
119	613	AREA IV-787	43593	2719
120	880	AREA V	43293	2900
121	952	AREA V	43293	2903
122	307	AREA V	43293	2904
123	880	AREA V	44193	2519
124	188	AREA V	44193	2520
125	322	AREA V	44193	2549
126	868	AREA V	44193	2521
127	707	AREA VI	44393	2943
128	719	AREA VI	44393	2944
129	157	AREA VI	44393	2945

**Table Six**  
**Sample Area I**  
**Drummed Investigated Material (IDM) from the Solar Ponds Areas**  
**Arranged By Sorted Random Number**

Item	Random Number	LOCATION	Borehole	DRUMS
1	62	AREA I	40393	2882
2	67	AREA I	44893	2658
3	112	AREA I	40593	2879
4	155	AREA I	44693	2577
5	160	AREA I	45293	2664
6	166	AREA I	40593	2703
7	186	AREA I	40193	2592
8	226	AREA I	45393	3168
9	265	AREA I	44993	2689
10	287	AREA I	40093	2645
11	288	AREA I	40193	2614
12	295	AREA I	45093	3166
13	298	AREA I	40393	2881
14	312	AREA I	44893	2648
15	317	AREA I	44993	2691
16	358	AREA I	40193	2590
17	359	AREA I	40593	2692
18	464	AREA I	44993	2690
19	481	AREA I	45293	2663
20	484	AREA I	40193	2591
21	506	AREA I	40493	2621
22	544	AREA I	40593	2704
23	554	AREA I	45393	3167
24	564	AREA I	40093	2631
25	591	AREA I	45093	3165
26	633	AREA I	44793	2619
27	666	AREA I	45293	2662
28	724	AREA I	40393	2897
29	778	AREA I	44893	2657
30	819	AREA I	44793	2620
31	845	AREA I	45293	2665
32	878	AREA I	40093	2630
33	924	AREA I	40293	2701
34	966	AREA I	44893	2662

**Table Seven**  
**Sample Area II**  
**Drummed Investigated Material (IDM) from the Solar Ponds Areas**  
**Arranged By Sorted Random Number**

Item	Random Number	Area	Borehole	Drum Number
1	12	AREA II	46293	3126
2	145	AREA II	42693	2901
3	151	AREA II	45893	3094
4	198	AREA II	45693	3113
5	241	AREA II	40793	3044
6	263	AREA II	41193	2899
7	318	AREA II	41193	2716
8	342	AREA II	45793	3112
9	446	AREA II	41293	2988
10	471	AREA II	45893	3103
11	520	AREA II	46193	3124
12	602	AREA II	40693	2990
13	612	AREA II	40893	2518
14	638	AREA II	40893	2504
15	644	AREA II	46293	3127
16	887	AREA II	46193	3125
17	904	AREA II	40793	3043
18	923	AREA II	45893	3093

**Table Eight**  
Sample Area III  
**Drummed Investigated Material (IDM) from the Solar Ponds Areas**  
Arranged By Sorted Random Number

Item	Random Number	Area	Borehole	Drum Number
1	0	AREA III-C	40993	3073
2	1	AREA III	41593	3149
3	4	AREA III	43493	3230
4	45	AREA III-C	42993	2606
5	53	AREA III	43693	3128
6	81	AREA III	41693	2987
7	95	AREA III-C	42093	2603
8	107	AREA III	46793	2702
9	116	AREA III	43893	2902
10	124	AREA III	42193	3117
11	125	AREA III	43793	2992
12	155	AREA III	43793	2936
13	163	AREA III	41593	3152
14	184	AREA III	41693	2989
15	203	AREA III-	41793	2986
16	207	AREA III-C	42393	2713
17	233	AREA III	41593	3151
18	238	AREA III-C	41993	2604
19	255	AREA III-C	42093	2602
20	264	AREA III	43793	2991
21	284	AREA III	43193	2934
22	286	AREA III	43393	3105
23	339	AREA III	47093	4268
24	353	AREA III-C	40993	3071
25	373	AREA III	42493	3122
26	393	AREA III-C	40993	3074,
27	406	AREA III-C	42993	2714
28	428	AREA III-C	42393	2715
29	442	AREA III	42293	3233
30	471	AREA III	42493	3123
31	472	AREA III	44093	2939
32	475	AREA III-C	41993	2607
33	480	AREA III	43693	3119
34	496	AREA III	44093	2898
35	531	AREA III	43993	2940

**Table Eight con't**  
**Sample Area III**  
**Drummed Investigated Material (IDM) from the Solar Ponds Areas**  
**Arranged By Sorted Random Number**

Item	Random Number	Area	Borehole	Drum Number
36	533	AREA III	46693	none?4248
37	543	AREA III	42593	3081
38	566	AREA III	43693	3118
39	571	AREA III-C	42993	2667
40	574	AREA III	41693	2935,
41	595	AREA III-C	40993	3072
42	601	AREA III	43193	2931
43	607	AREA III	42593	3082
44	626	AREA III-C	41993	2666
45	645	AREA III	42593	3079
46	647	AREA III	41593	3129
47	648	AREA III	43693	3115
48	662	AREA III	42593	3080
49	672	AREA III	43393	3104
50	675	AREA III	43993	2941
51	687	AREA III-C	42993	2668
52	704	AREA III	42493	3114
53	716	AREA III-C	41993	2605
54	738	AREA III	42193	3106
55	749	AREA III	46593	none?4277
56	796	AREA III	42193	3116
57	840	AREA III	43993	2942
58	847	AREA III	43893	2720
59	901	AREA III	41693	2993
60	942	AREA III	42193	3120
61	959	AREA III-	41793	2985
62	983	AREA III	43893	2938

**Table Nine**  
Sample Area IV, V, and VI  
Drummed Investigated Material (IDM) from the Solar Ponds Areas  
Arranged By Sorted Random Number

Item	Random Number	Area	Borehole	Drum Number
1	379	AREA IV-787	43593	2718
2	505	AREA IV-787	42893	3092
3	613	AREA IV-787	43593	2719
4	629	AREA IV-787	43593	2717
5	700	AREA IV-787	42893	3091
1	188	AREA V	44193	2520
2	307	AREA V	43293	2904
3	322	AREA V	44193	2549
4	868	AREA V	44193	2521
5	880	AREA V	43293	2900
6	880	AREA V	44193	2519
7	952	AREA V	43293	2903
1	157	AREA VI	44393	2945
2	707	AREA VI	44393	2943
3	719	AREA VI	44393	2944

**Attachment A**

**Environmental Operations Management  
Investigation Derived Material Drums located in Tent 6 on 750 Pad.**

**Tabulated by Borehole and Fill Date**

This information was obtained from Ed Kyle EOM at x 8642 in Bldg 080, on 10/6/94.  
The fill date is the first date column. The second date column is the record date.



EG&G ROCKY FLATS, INC.  
P. O. BOX 464, GOLDEN, CO 80402 (303) 966-7000

## FAX TRANSMITTAL COVER SHEET

DATE: 10/6/94

TO: Ed Kehl

ORGANIZATION: ERPD/Fom

FAX NUMBER: 8554

FROM: Mike Pepping

ORGANIZATION: ERPD/Fom

FAX NUMBER: 1-(303) 966-6533

TOTAL PAGES: 1+ 5

COMMENTS: Ed: Here's the ou-4 drums sorted  
by Well #

Mike

*142*

## DRILLING DRUMS

1992

Drums

	A	B	C	D	E	F	G	H	I
3	2504	40893		12/15/92	AE	OU4	Off	2/16/93	30
4	2518	40893		12/15/92	AE	OU4	Off	2/16/93	30
5	2519	44193		12/21/92	AE	OU4	750 PAD	2/16/93	30
6	2520	44193		12/21/92	AE	OU4	750 PAD	2/16/93	30
7	2549	44193		1/5/93	AE	OU4	750 PAD	3/15/93	30
8	2521	44193		1/6/93	AE	OU4	750 PAD	3/15/93	30
9	2546	44193		1/6/93	AE	OU4	750 PAD	2/16/93	30
10	2547	44193		1/6/93	AE	OU4	750 PAD	2/16/93	30
11	2548	44193		1/6/93	AE	OU4	750 PAD	2/16/93	30
12	2501	44593		12/14/92	AE	OU4	Off	2/16/93	30
13	2502	44593		12/14/92	AE	OU4	Off	2/16/93	30
14	2503	44593		12/14/92	AE	OU4	Off	2/16/93	30
15	2573	44693		1/4/93	AE	OU4		2/16/93	30
16	2574	44693		1/4/93	AE	OU4		3/4/93	30
17	2568	46393		12/30/92	AE	OU4		2/16/93	30
18	2572	46393		12/30/92	AE	OU4		2/16/93	30
19	2575	46393		12/30/92	AE	OU4		2/16/93	30
20	2569	46493		12/28/92	AE	OU4		2/16/93	30
21	2570	46493		12/28/92	AE	OU4		2/16/93	30
22	2571	46493		12/28/92	AE	OU4		2/16/93	30

## DRILLING DRUMS

1993

Drums

	A	B	C	D	E	F	G	H	I
5	2630	40093	-	1/13/93	AE	OU4		2/16/93	30
6	2631	40093	-	1/13/93	AE	OU4		2/16/93	30
7	2645	40093	-	1/13/93	AE	OU4		2/16/93	30
8	2590	40193	-	1/6/93	AE	OU4		2/16/93	30
9	2591	40193	-	1/6/93	AE	OU4		2/16/93	30
10	2592	40193	-	1/6/93	AE	OU4		2/16/93	30
11	2614	40193	-	1/6/93	AE	OU4		2/16/93	30
12	2618	40193	-	1/7/93	AE	OU4		2/16/93	30
13	2701	40293	-	1/20/93	AE	OU4		2/16/93	30
14	2881	40393	-	1/29/93	AE	OU4		2/23/93	30
15	2882	40393	-	1/29/93	AE	OU4		2/23/93	30
16	2897	40393	-	1/29/93	AE	OU4		2/23/93	30
17	2621	40493	-	1/8/93	AE	OU4		2/16/93	30
18	2692	40593	-	1/27/93	AE	OU4		2/16/93	30
19	2703	40593	-	1/26/93	AE	OU4		2/16/93	30
20	2704	40593	-	1/26/93	AE	OU4		2/16/93	30
21	2879	40593	-	1/27/93	AE	OU4		3/8/93	30
22	2880	40593	-	1/27/93	AE	OU4		3/11/93	30
23	2990	40693	-	2/26/93	AE	OU4	750 PAD	3/15/93	30
24	3043	40793	-	3/2/93	AE	OU4	PA	3/8/93	30
25	3044	40793	-	3/2/93	AE	OU4	PA	3/8/93	30
26	3071	40993	NC Pond	3/3/93	AE	OU4	PA	3/24/93	30
27	3072	40993	NC Pond	3/5/93	AE	OU4	PA	3/24/93	30
28	3073	40993	NC Pond	3/5/93	AE	OU4	PA	3/24/94	30
29	3074	40993	NC Pond	3/5/93	AE	OU4	PA	3/24/93	30
30	3077	40993	NC Pond	3/5/93	AE	OU4	PA	3/24/93	30
31	3078	40993	NC Pond	3/5/93	AE	OU4	PA	3/24/93	30
32	2716	41193	-	1/28/93	AE	OU4	750 PAD	3/10/93	30
33	2899	41193	-	1/28/93	AE	OU4	PA	3/10/93	30
34	2988	41293	-	2/24/93	AE	OU4	750 PAD	3/10/93	30
35	3129	41593	A Pond	4/6/93	AE	OU4	PA	4/28/93	30
36	3149	41593	A Pond	4/6/93	AE	OU4	PA	4/28/93	30
37	3151	41593	A Pond	4/6/93	AE	OU4	PA	4/28/93	30
38	3152	41593	-	4/6/93	AE	OU4	PA	4/28/93	30
39	2935	41693	E A Pond	2/22/93	AE	OU4	PA	3/8/93	30
40	2987	41693	E A Pond	2/22/93	AE	OU4	PA	3/8/93	30
41	2989	41693	E A Pond	2/22/93	AE	OU4	PA	3/8/93	30
42	2993	41693	E A Pond	2/23/93	AE	OU4	PA	3/11/93	30
43	2985	41793	-	2/22/93	AE	OU4	750 PAD	3/9/93	30
44	2986	41793	-	2/22/93	AE	OU4	750 PAD	3/9/93	30
45	2604	41993	-	1/14/93	AE	OU4	PA	2/16/93	30
46	2605	41993	-	1/13/93	AE	OU4	PA	2/16/93	30
47	2607	41993	-	1/14/93	AE	OU4	PA	2/16/93	30
48	2666	41993	-	1/19/93	AE	OU4	PA	3/9/93	30
49	2602	42093	-	1/8/93	AE	OU4	PA	2/16/93	30
50	2603	42093	-	1/12/93	AE	OU4	PA	2/16/93	30
51	3106	42193	A Pond	3/19/93	AE	OU4	PA	3/26/93	30

## DRILLING DRUMS

	A	B	C	D	E	F	G	H	I
52	3116	42193	A Pond	3/22/93	AE	OU4	PA	3/26/93	30
53	3117	42193	A Pond	3/22/93	AE	OU4	PA	3/26/93	30
54	3120	42193	A Pond	3/24/93	AE	OU4	PA	3/26/93	30
55	3121	42193	A Pond	3/31/93	AE	OU4	PA	5/6/93	30
56	3145	42193	A Pond	3/31/93	AE	OU4	PA	5/6/93	30
57	3146	42193	A Pond	3/31/93	AE	OU4	PA	5/6/93	30
58	3147	42193	A Pond	3/31/93	AE	OU4	PA	5/6/93	30
59	3148	42193	A Pond	3/31/93	AE	OU4	PA	5/6/93	30
60	3150	42193	A Pond	3/31/93	AE	OU4	PA	5/6/93	30
61	3233	42293	BPond Berm	4/16/93	AE	OU4	PA	5/6/93	30
62	2713	42393		1/27/93	AE	OU4	PA	3/10/93	30
63	2715	42393		1/27/93	AE	OU4	PA	3/10/93	30
64	3122	42493	A Pond	3/22/93	AE	OU4	PA	3/26/93	30
65	3123	42493	A Pond	3/23/93	AE	OU4	PA	3/26/93	30
66	3114	42494	A Pond	3/24/93	AE	OU4	PA	3/26/93	30
67	3079	42593	A Pond	3/16/93	AE	OU4	PA	3/22/93	30
68	3080	42593	A Pond	3/16/93	AE	OU4	PA	3/22/93	30
69	3081	42593	A Pond	3/17/93	AE	OU4	PA	3/22/93	30
70	3082	42593	A Pond	3/17/93	AE	OU4	PA	3/22/93	30
71	3083	42593	A Pond	3/17/93	AE	OU4	PA	3/24/93	30
72	3084	42593	A Pond	3/17/93	AE	OU4	PA	5/6/93	30
73	2901	42693		2/3/93	AE	OU4	750 PAD	3/11/93	30
74	3091	42893		3/11/93	AE	OU4	PA	3/24/93	30
75	3092	42893		3/11/93	AE	OU4	PA	3/24/93	30
76	2606	42993		1/20/93	AE	OU4	PA	2/16/93	30
77	2667	42993		1/20/93	AE	OU4	PA	2/16/93	30
78	2668	42993		1/20/93	AE	OU4	PA	2/16/93	30
79	2714	42993		1/25/93	AE	OU4	PA	3/10/93	30
80	2931	43193		2/18/93	AE	OU4	750 PAD	3/9/93	30
81	2934	43193		2/18/93	AE	OU4	750 PAD	3/9/93	30
82	2900	43293		1/29/93	AE	OU4	750 PAD	3/10/93	30
83	2903	43293		1/29/93	AE	OU4	750 PAD	3/10/93	30
84	2904	43293		2/2/93	AE	OU4	750 PAD	3/10/93	30
85	3104	43393	A Pond	3/18/93	AE	OU4	PA	3/24/93	30
86	3105	43393	A Pond	3/18/93	AE	OU4	PA	3/24/93	30
87	3230	43493	BPond Berm	4/21/93	AE	OU4	PA	5/6/93	30
88	2717	43593		1/26/93	AE	OU4	PA	2/16/93	30
89	2718	43593		1/26/93	AE	OU4	PA	2/16/93	30
90	2719	43593		1/27/93	AE	OU4	PA	3/10/93	30
91	3115	43693	A Pond	3/24/93	AE	OU4	PA	9/20/93	30
92	3118	43693	A Pond	3/24/93	AE	OU4	PA	3/30/93	30
93	3119	43693	A Pond	3/25/93	AE	OU4	PA	4/1/93	30
94	3128	43693	A Pond	3/26/93	AE	OU4	PA	5/20/93	30
95	2936	43793	E A Pond	2/24/93	AE	OU4	PA	3/15/93	30
96	2991	43793	E A Pond	2/24/93	AE	OU4	PA	3/15/93	30
97	2992	43793	E A Pond	2/25/93	AE	OU4	PA	3/15/93	30
98	2720	43893		2/8/93	AE	OU4	750 PAD	3/10/93	30

## DRILLING DRUMS

	A	B	C	D	E	F	G	H	I
99	2902	43893	-	2/5/93	AE	OU4	750 PAD	3/11/93	30
100	2938	43893	-	2/8/93	AE	OU4	750 PAD	3/10/93	30
101	2940	43993	E A Pond	2/11/93	AE	OU4	PA	3/9/93	30
102	2941	43993	E A Pond	2/18/93	AE	OU4	PA	3/9/93	30
103	2942	43993	E A Pond	2/10/93	AE	OU4	PA	3/9/93	30
104	2898	44093	-	2/10/93	AE	OU4	750 PAD	3/10/93	30
105	2939	44093	-	2/10/93	AE	OU4	750 PAD	3/10/93	30
106	2578	44193	-	1/6/93	AE	OU4	750 PAD	2/16/93	30
107	2579	44193	-	1/6/93	AE	OU4	750 PAD	2/16/93	30
108	2580	44193	-	1/6/93	AE	OU4	750 PAD	2/16/93	30
109	2581	44193	-	1/6/93	AE	OU4	750 PAD	2/16/93	30
110	3153	44193	-	3/30/93	AE	OU4	750 PAD	4/2/93	30
111	3154	44193	-	3/30/93	AE	OU4	750 PAD	4/2/93	30
112	3155	44193	-	3/31/93	AE	OU4	750 PAD	4/2/93	30
113	3156	44193	-	3/31/93	AE	OU4	750 PAD	4/2/93	30
114	3157	44193	-	3/31/93	AE	OU4	750 PAD	4/2/93	30
115	3160	44193	-	3/31/93	AE	OU4	750 PAD	5/20/93	30
116	2943	44393	-	2/8/93	AE	OU4	PA	3/10/93	30
117	2944	44393	-	2/8/93	AE	OU4	PA	3/10/93	30
118	2945	44393	-	2/8/93	AE	OU4	PA	3/10/93	30
119	2577	44693	-	1/5/93	AE	OU4	-	2/16/93	30
120	2619	44793	-	1/12/93	AE	OU4	-	2/16/93	30
121	2620	44793	-	1/12/93	AE	OU4	-	2/16/93	30
122	2648	44893	-	1/15/93	AE	OU4	-	2/16/93	30
123	2657	44893	-	1/15/93	AE	OU4	-	2/16/93	30
124	2658	44893	-	1/15/93	AE	OU4	-	2/16/93	30
125	2661	44893	-	1/15/93	AE	OU4	-	2/16/93	30
126	2689	44993	-	1/19/93	AE	OU4	-	2/16/93	30
127	2690	44993	-	1/19/93	AE	OU4	-	2/16/93	30
128	2691	44993	-	1/20/93	AE	OU4	-	2/16/93	30
129	3165	45093	-	4/5/93	AE	OU4	-	4/12/93	30
130	3166	45093	-	4/5/93	AE	OU4	-	4/12/93	30
131	2662	45293	PZ03C	1/18/93	AE	OU4	-	2/16/93	30
132	2663	45293	PZ03C	1/18/93	AE	OU4	-	2/16/93	30
133	2664	45293	PZ03C	1/18/93	AE	OU4	-	2/16/93	30
134	2665	45293	PZ03C	1/18/93	AE	OU4	-	2/16/93	30
135	3167	45393	-	4/5/93	AE	OU4	-	4/12/93	30
136	3168	45393	-	4/5/93	AE	OU4	-	4/12/93	30
137	3113	45693	-	3/19/93	AE	OU4	750 PAD	5/13/93	30
138	3112	45793	-	3/18/93	AE	OU4	750 PAD	3/22/93	30
139	3093	45893	-	3/16/93	AE	OU4	PA	3/22/93	30
140	3094	45893	-	3/16/93	AE	OU4	PA	3/22/93	30
141	3103	45893	-	3/17/93	AE	OU4	PA	3/22/93	30
142	3124	46193	-	3/23/93	AE	OU4	PA	3/30/93	30
143	3125	46193	-	3/24/93	AE	OU4	750 PAD	3/30/93	30
144	3126	46293	-	3/25/93	AE	OU4	PA	4/1/93	30
145	3127	46293	-	3/25/93	AE	OU4	PA	4/1/93	30

## DRILLING DRUMS

	A	B	C	D	E	F	G	H	I
146	2702	46793	-	1/26/93	AE	OU4		3/8/93	30
147	3158	207A	ALL WELLS	4/9/93	AE	OU4	Off	5/23/93	30
148	2937	All Wells	Soil/Grout	5/14/93	AE	OU4	PA	6/4/93	30

**Attachment B**

**Random Number Tables**

## PROBABILITY AND STATISTICS

Table of Random Units

## A TABLE OF 14,000 RANDOM UNITS

I used last digits 545  
 two if repeated selected next one

Line/Col.	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
1	10480	15011	01536	02011	81647	01646	69179	14194	62590	36207	20969	99570	91291	90700
2	22368	46573	25595	85393	30995	89198	27982	53402	93965	34095	52666	19174	39815	99505
3	24130	48360	22527	97265	76393	64809	15179	24830	49340	32081	30680	19655	63348	58629
4	42167	93093	06243	61680	07856	16376	39440	53537	71341	57004	00849	74917	97758	16379
5	37570	39975	81837	16656	06121	91782	60468	81305	49684	60672	14110	06927	01263	54613
6	77921	06907	11008	42751	27756	53498	18602	70659	90655	15053	21916	81825	44394	42880
7	99582	72905	56420	69994	98872	31016	71194	18738	44013	48840	63213	21069	10634	12952
8	96301	91977	05463	07972	18876	20922	94595	56869	69014	60045	18425	84903	42508	32307
9	89579	14342	63661	10281	17453	18103	57740	84378	25331	12566	58678	44947	05585	56941
10	85475	36857	43342	53988	53060	59533	38867	62300	08158	17983	16439	11458	18593	64952
11	28918	69578	88231	33276	70997	79036	56865	05359	90106	31595	01547	85590	91610	78188
12	63553	40961	48235	03427	49628	69445	18663	72695	52180	20847	12234	90511	33703	90322
13	09429	93969	52636	92737	88974	33488	36320	17617	30015	08272	84115	27156	30613	74952
14	10365	61129	87529	85889	48237	52267	67689	93394	01511	26358	83104	20285	29975	89868
15	07119	97336	71048	08178	77233	13916	47564	81056	97735	85977	29372	74461	28551	90707
16	51085	12765	51821	51259	77452	16308	60756	92144	49442	53900	70960	63990	75601	40719
17	02368	21382	52404	60268	89368	19885	55322	44819	01188	65255	64835	44919	05944	55157
18	01011	54092	33362	94904	31273	04146	18594	29852	71585	85030	51132	01915	92747	64951
19	52162	53916	46369	58586	23216	14513	83149	98736	23495	64350	94738	17752	35156	35749
20	07056	97628	33787	09998	42698	06691	70988	13602	51851	46104	88916	19509	25625	58104
21	48663	91245	85828	14346	09172	30168	90229	04734	59193	22178	30421	61666	99904	32812
22	54164	58492	22421	74103	47070	25306	76488	26384	58151	06646	21524	15227	96909	44592
23	32639	32363	05597	24200	13363	38005	94342	28728	35806	06912	17012	64161	18296	22851
24	29334	27001	87637	87308	58731	00256	45834	15398	46557	41135	10367	07684	36188	18510
25	02488	33062	28834	07351	19731	92420	60952	61280	50001	67658	32586	86679	50720	94953
26	81525	72295	04839	96423	24878	82651	66566	14778	76797	14780	13300	87074	79666	95725
27	29676	20591	68086	26432	46901	20849	89768	81536	86645	12659	92259	57102	80428	25280
28	00742	57392	39064	66432	84873	40027	32832	61362	98947	96067	64760	64584	96096	98253
29	05366	04213	25669	26422	44407	44048	37937	63904	45766	66134	75470	66520	34693	90449
30	91921	26418	64117	94305	26766	25940	39972	22209	71500	64568	91402	42416	07844	69618
31	00582	04711	87917	77341	42206	35126	74087	99547	81817	42607	43808	76655	62028	76630
32	00725	69884	62797	56170	86324	88072	76222	36086	84637	93161	76038	63855	77919	88006
33	69011	65797	95876	55293	18988	27354	26575	08625	40801	59920	29841	80150	12777	48501
34	25976	57948	29888	88604	67917	48708	18912	82271	65424	69774	33611	54262	85963	03547
35	09763	83473	73577	12908	30883	18317	28290	35797	05998	41688	34952	37888	38917	88050
36	91567	42595	27958	30134	04024	86385	29880	99730	55536	84855	29080	09250	79856	73211
37	17955	56349	90999	49127	20044	59931	06115	20542	18059	02008	73708	83517	36103	42791
38	46503	18584	18845	49618	02304	51038	20655	58727	28168	15475	56042	53389	20562	87338
39	92157	89634	94824	78171	84610	82834	09922	25417	44137	48413	25555	21246	35509	20468
40	14577	62765	35605	81263	39667	47358	56873	56307	61607	49518	89656	20103	77490	18062
41	98427	07523	33362	64270	01638	92477	66969	98420	04880	45585	46565	04102	46880	45709
42	34914	63976	88720	82765	34476	17032	87589	40836	32427	70002	70663	88863	77775	69348
43	70060	28277	39475	46473	23219	53416	94970	25832	69975	94884	19661	72828	00102	66794
44	53976	54914	06990	67245	68350	82948	11398	42878	80287	88267	47363	46634	06541	97809
45	76072	29515	40980	07391	58745	25774	22987	80059	39911	96189	41151	14222	60697	59583
46	90725	52210	83974	29992	65831	38857	50490	83765	55657	14361	31720	57375	56228	41546
47	64364	67412	33339	31926	14883	24413	59744	92351	97473	89286	35931	04110	23726	51900
48	08962	00358	31662	25388	61642	34072	81249	35648	56891	69352	48373	45578	78547	81788
49	95012	68379	93526	70765	10593	04542	76463	54328	02349	17247	28865	14777	62730	92277
50	15664	10493	20492	38391	91132	21999	59516	81652	27195	48223	46751	22923	32261	85653

## PROBABILITY AND STATISTICS

## Table of Random Units

A TABLE OF 14,000 RANDOM UNITS (Continued)

Line/Col.	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	Line/Col.
51	16408	81899	04153	53381	79401	21438	83035	92350	36693	31238	59649	91754	72772	02328	101
52	18629	81953	05520	91962	04739	13092	97662	24822	94730	06496	35090	04822	86772	98298	102
53	73115	35101	47498	87637	99016	71060	88824	71013	18735	20286	23153	72924	35165	43040	103
54	57491	16703	23167	49323	45021	33132	12544	41035	80780	45393	44812	12515	98931	91202	104
55	30405	83946	23792	14422	15058	45799	22716	19792	09983	74353	68668	30429	70735	25499	105
56	16631	35006	85900	98275	32388	52390	16815	69298	82732	38480	73817	32523	41961	44437	106
57	96773	20206	42559	78985	05300	22164	24369	54224	35083	19687	11052	91491	60383	19744	107
58	38935	64202	14349	82674	66523	44133	00697	35552	35970	19124	63318	29686	03387	59844	108
59	31624	76384	17403	53363	44167	64486	64753	75366	76554	31601	12614	33072	60332	92325	109
60	78919	19474	23632	27889	47914	02584	37680	20801	72152	39339	34806	08930	85001	87820	110
61	03931	33309	57047	74211	63445	17361	62825	39908	05607	91284	68833	25570	38818	46920	111
62	74426	33278	43972	10119	89917	15665	52872	73823	73144	88662	88970	74492	51805	99378	112
63	09066	00903	20795	95452	92648	45454	09552	88815	16553	51125	79375	97596	16296	66092	113
64	42238	12426	87025	14267	20979	04508	64535	31355	86064	29472	47689	05974	52468	16834	114
65	16153	08002	26504	41744	81959	65642	74240	56302	00033	67107	77510	70625	28725	34191	115
66	21457	40742	29820	96783	29400	21840	15035	34537	33310	06116	95240	15957	16572	06004	116
67	21581	57802	02050	89728	17937	37621	47075	42080	97403	48626	68995	43805	33386	21597	117
68	55612	78095	83197	33732	05810	24813	86902	60397	16489	03264	88525	42786	05269	92533	118
69	44657	66999	99324	51281	84463	60563	79312	93454	68876	25471	93911	25650	12682	73573	119
70	91340	84979	46949	81973	37949	61023	43997	15263	80644	43942	89203	71795	99533	50501	120
71	91227	21199	31935	27022	84067	05462	35216	14486	29891	68607	41867	14951	91696	85043	121
72	50001	38140	66321	19924	72163	09538	12151	06878	91903	18749	34405	56087	82790	70929	122
73	65390	05224	72958	28609	81406	39147	25549	48542	42627	45233	57202	04617	23772	07894	123
74	27504	96131	83944	41575	10573	08619	64482	73923	36152	05184	94142	25299	84387	34974	124
75	37169	94851	39117	89632	00959	16487	65536	49071	39782	17095	02330	74301	00275	48220	125
76	11508	70225	51111	38351	19444	66499	71945	05422	13442	78675	84081	66938	93654	50894	126
77	37449	30362	06694	54690	04052	53115	62757	95348	78662	11163	81651	50245	34971	52924	127
78	46515	70331	85922	38329	57015	15765	97161	17869	45349	61796	66345	81073	49106	79860	128
79	30986	81223	42416	58353	21532	30502	32305	86482	05174	07901	54339	58861	74818	48942	129
80	63798	64995	46583	09765	44160	78128	83991	42865	92520	83531	80377	36909	81250	54238	130
81	82486	84846	99254	87632	43218	50076	21361	64816	51202	88124	41870	52689	51275	63554	131
82	21885	32908	92431	09060	64297	51674	64126	62570	26123	05155	59194	52799	28225	85762	132
83	60336	98782	07408	53458	13564	59089	26445	29789	85205	41001	12353	12133	14645	23541	133
84	43937	46891	24010	25580	86355	33941	23786	54990	71899	15475	95434	98227	21824	19585	134
85	97656	63175	89303	16275	07100	92063	21942	18611	47348	20203	18534	03862	78095	50136	135
86	03299	01221	05418	38982	55758	92237	26759	86367	21216	98442	08303	56613	91511	75923	136
87	79626	06486	03574	17668	07785	76020	79924	25631	83325	88428	85076	72811	22717	50583	137
88	85636	66335	47539	03129	65651	11977	02510	26113	99447	68645	34327	15152	55230	93448	138
89	18039	14367	61337	06177	12143	46609	32989	74014	64708	00533	35398	58408	13261	47908	139
90	08362	15656	60627	36478	65648	16764	53412	09013	07832	41574	17639	82163	60859	75567	140
91	79556	29068	04142	16268	15387	12856	66227	38358	22478	73373	88732	09443	82558	05250	141
92	92608	82674	27072	32534	17075	27698	98204	63863	11051	34648	88022	56148	34925	57031	142
93	23982	25883	40055	67006	12293	02753	14827	22235	35071	99704	37543	11601	35503	85171	143
94	09915	96306	05908	97901	28395	14186	00821	80703	70426	75647	76310	88717	37890	40129	144
95	50937	33300	26695	62247	69927	76123	50842	43834	86654	70959	79725	93872	28117	19223	145
96	42488	78077	69882	61657	34136	79180	97526	43092	04098	73571	80799	76536	71255	64238	146
97	46784	86273	63003	93017	31204	36692	40202	35275	57306	55543	53203	18098	47625	88684	147
98	03237	45430	55417	63282	90816	17349	88298	90183	36600	78406	06216	95787	42579	90730	148
99	86591	81482	52667	61583	14972	90053	89534	76036	49199	43716	97548	04379	48370	28672	149
100	38534	01715	94964	87288	65680	43772	39580	12918	86537	62738	19636	51132	25739	56247	150

Table of Random Units

## A TABLE OF 14,000 RANDOM UNITS (Continued)

Line/Col.	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
151	38128	51178	75096	13609	18110	73533	42564	59870	29399	67834	91055	89917	51096	89011
152	60950	00455	73254	96067	50717	13878	03216	78274	65563	37011	91283	33914	91303	49324
153	90524	17320	29832	96118	75792	25326	22940	24904	80523	38928	91374	55597	97567	38914
154	49897	18278	67160	39408	07056	43517	84426	59650	20247	19293	02019	14790	02852	05810
155	18494	99209	81060	19488	65596	59787	47939	91225	98768	43688	00438	05548	09443	82987
156	65373	72984	30171	37741	70203	94094	87261	30056	55124	70133	18936	02138	59372	00713
157	40653	12843	04213	70025	95360	55774	76439	61763	52S17	81151	52188	31940	54273	49033
158	51638	22238	56344	44587	82321	50317	74541	07719	25472	41602	77318	15145	57515	07630
159	69742	99303	62578	83575	30337	07488	51941	84316	42067	49692	28616	29101	03013	73411
160	58012	74072	67488	74580	47992	69482	58624	17106	47538	13452	22620	24260	40155	74710
161	18348	19855	42887	08279	43206	47077	42637	45606	00011	20662	14642	49984	94509	56399
162	59614	09193	58064	29086	44385	45740	70752	05663	49081	26960	57454	09264	24142	74648
163	75688	28630	39210	52897	62748	72658	98059	67202	72789	01869	13496	14663	87645	89713
164	13041	77802	69101	70061	35480	34576	15412	81304	58757	35498	94830	75521	00603	97704
165	96656	86420	96475	86458	54483	96419	55417	41375	76886	19008	66877	35934	59801	00497
166	03363	82042	15942	14549	38324	87094	19069	67590	11087	68570	22591	65232	85915	91489
167	70366	08390	69155	25496	13240	57407	91407	49160	07379	34444	94567	66035	38918	65708
168	47870	36605	12927	16043	53257	93796	52721	73120	48025	76074	05605	67422	41646	14557
169	79504	77606	22761	30518	28373	73898	30550	76684	77366	32276	04690	61687	64798	66278
170	46967	74841	50923	15339	37755	98995	40162	89561	69199	42257	11647	47603	48779	97907
171	14558	50769	35444	59030	87516	48193	02945	00922	48189	04724	21263	20892	92955	90251
172	12440	25057	01132	38611	28135	68089	10954	10097	54243	06460	50856	65435	79377	53899
173	32293	29938	68653	10497	98919	46587	77701	99119	93165	67788	17638	23097	21468	36992
174	10640	21875	72462	77981	56550	55999	87310	69643	45124	00349	25748	00844	96831	30651
175	47615	23169	39571	56072	20628	21788	51736	33133	72696	32605	41569	76148	91544	21171
176	16948	11128	71624	72734	49084	96303	27830	45817	67867	18062	87453	17226	72904	71474
177	21258	61092	66634	70335	92448	17354	83432	49608	66520	06442	59664	20420	39201	69548
178	15072	48853	15178	30730	47481	48490	41436	25015	49932	20474	53821	51015	79841	32405
179	99154	57412	09858	65671	70655	71479	63520	31357	56968	06729	34465	70685	04184	23239
180	08759	61089	23706	32094	35426	36666	63988	98844	37533	08269	27021	45886	22835	78431
181	67323	57839	61114	62192	47547	58023	84630	34886	98777	75442	95592	06141	45096	73117
182	09255	13986	84834	20764	72206	89393	34548	93438	88730	61805	78955	18952	46436	55700
183	36304	74712	00374	10107	85061	69228	81969	92216	03568	39630	81860	52824	50037	27954
184	15884	67429	86612	47367	10242	44880	12060	44309	46629	55105	66793	93173	00450	13311
185	18745	32031	35303	08134	33925	03044	50929	95418	04917	57506	24878	61733	92834	64434
186	72934	40086	88292	65728	38300	42323	64068	98373	48971	09049	50943	36538	05976	82118
187	17626	02944	20910	57662	80181	38579	24580	90529	52303	50436	29401	57824	86039	81063
188	27117	61399	50967	41399	81636	16663	15634	79717	04696	59240	25543	07989	63306	90946
189	93995	18678	90012	63645	85701	85269	62263	68331	00389	72571	15210	20769	44686	96170
190	67392	89421	00623	80725	62620	84162	87368	29560	00519	84545	08004	24526	41252	14533
191	04910	12261	37566	80016	21245	69377	50420	85658	55263	68667	78770	04633	14513	18008
192	81453	20283	79929	59839	23875	13245	46808	74124	74703	35769	95588	21014	37078	39176
193	19480	75790	48539	23703	15537	48885	02861	86587	74539	65227	90799	58789	96257	02758
194	21456	13162	74608	81011	55512	07481	93551	72189	76261	91206	89941	15132	37738	59224
195	89406	20912	46189	76376	25538	87212	20748	12831	57166	35026	16817	79121	18929	40638
196	09866	07414	55977	16419	01101	69343	13305	94302	80703	57910	36933	57771	42546	00001
197	86541	24681	23421	13521	28000	94917	07423	57523	97234	63951	42876	46429	09781	54188
198	10414	96941	06205	72222	57167	83902	07460	69507	10600	08N58	07685	44472	64220	27088
199	49942	06683	41479	58982	56288	42853	92196	20632	62045	78812	35895	51851	83534	10689
200	23095	68882	42291	23374	24299	27024	67460	94783	40937	18961	26053	78749	46704	21883

Table of Random Units

## A TABLE OF 14,000 RANDOM UNITS (Continued)

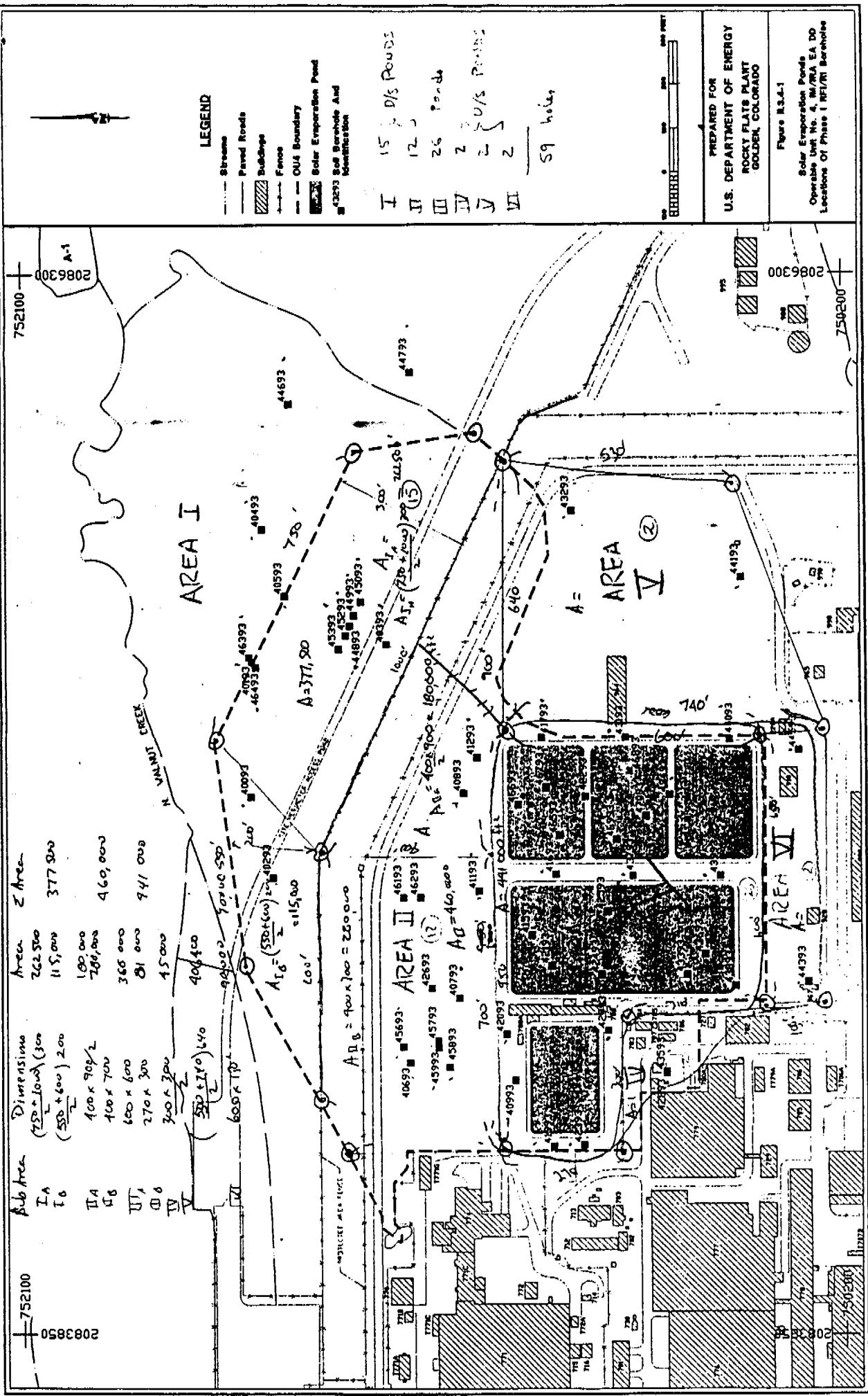
(11)	(12)	(13)	(14)	Line/Col.	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
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23153	72924	25165	02000	103	99052	47887	81085	64933	66270	80432	65793	83297	34142	13241	30590	97760	35848	91983
44812	12315	98931	01200	104	00199	50993	98603	38452	87890	94624	69721	57484	67501	77638	44331	11257	71131	11059
66668	30429	70735	21400	105	60578	06483	28733	37867	07936	98710	98539	27188	31237	80612	44488	97819	70401	95419
73817	32523	41961	44200	106	91240	18312	17441	01929	18163	69201	31211	54288	39296	37318	65724	90401	79017	62077
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12318	29686	00387	00000	108	35249	38646	34475	72417	60514	69257	12489	51924	86871	92446	36607	11458	30440	52639
12614	33072	60332	02200	109	38980	46600	11759	11900	46743	27860	77940	39298	97838	95145	32378	68038	89351	37005
14806	06930	85001	07300	110	10750	52745	38749	87365	58959	53731	89295	59062	39404	13198	59960	70408	29812	83126
8933	25570	38818	46000	111	38247	27850	73958	20673	37800	63835	71051	84724	52492	22342	78071	17456	96104	18327
8970	74492	51805	00200	112	70994	66986	99744	72438	01174	42159	11392	20724	54322	36923	70009	23233	65438	59685
9373	97506	16296	00000	113	99638	94702	11463	18148	81386	80431	90628	52506	02016	85151	88598	47821	00265	82525
7689	05974	52468	18604	114	72055	15774	43857	99805	10419	76939	25993	03544	21560	83471	43989	90770	22965	44247
7510	70625	28725	34104	115	24038	65541	85788	55835	38835	59399	13790	35112	01324	39520	76210	22467	83275	32286
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8995	43805	33386	21207	117	35553	71628	70189	26436	63407	91178	90348	55359	80392	41012	36270	77786	89578	21059
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1567	14951	91606	00000	121	76509	47069	86378	41797	11910	49672	88575	97966	32466	10083	54728	81972	58975	30761
4405	56087	82790	70204	122	19689	90332	04315	21358	97248	11188	39062	63312	52496	07349	79178	33692	57352	72862
7202	94617	23772	07300	123	42751	35318	97513	61537	54955	08159	00337	80778	27507	95478	21252	12746	37554	97775
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530	74301	00278	00000	125	96518	48688	20996	11090	48396	57177	83867	86464	14342	21545	46717	72364	86954	55580
061	66638	93654	00004	126	35726	58643	76869	84622	39098	36083	72505	92265	23107	60278	05822	46760	44294	07672
651	50243	34071	02204	127	39737	42750	48968	70536	84864	64952	38404	94317	65402	13589	01055	79044	19308	83623
345	81073	49108	70000	128	97025	66492	56177	04049	80312	48028	26408	43591	75528	65341	49044	95495	81256	53214
379	58861	74818	00002	129	62814	08075	09788	56350	76787	51501	54509	49295	85830	59860	30883	89660	96142	18354
377	35909	81250	04200	130	25578	22950	15227	83291	41737	79599	96191	71845	86899	70694	24290	01551	80092	82118
570	52689	51275	00000	131	68763	69576	88991	49662	46704	63362	56625	00481	73323	91427	15264	06969	57048	54149
194	52795	28225	03705	132	17900	00813	64361	60725	88974	61005	99709	30666	26451	11528	44323	34778	60342	60388
535	12133	14645	23541	133	71944	60227	63551	71109	05624	43836	58254	26160	32116	63403	35404	57146	10909	07346
534	98227	21834	10000	134	54684	93691	85132	64399	29182	44324	14491	55226	78793	34107	30374	48429	51376	09559
534	03862	78085	00100	135	25946	27623	11258	65204	52832	50880	22273	05554	99521	73791	85744	29276	70326	60251
303	56613	91511	70000	136	01353	39318	44961	44972	91766	90262	56073	06606	51826	18893	83448	31915	97764	75091
76	72911	22717	00000	137	99083	88191	27662	99113	57174	35571	99884	13951	71057	53961	61448	74909	07322	80960
27	15152	55220	00400	138	52021	45406	37945	75234	24327	86978	22644	87779	23753	99926	63898	54886	18051	96314
96	58408	13261	07000	139	78755	47744	43776	83098	03225	14281	83637	55984	13300	52212	58781	14905	46502	04472
39	82163	60630	73000	140	25282	69106	59180	16257	22810	43609	12224	25643	89884	31149	85423	32581	34374	70873
32	09442	82558	00000	141	11959	94202	02743	86847	79725	51811	12998	76844	05320	54238	53891	70226	38632	84776
22	66148	34925	00000	142	11644	13792	98190	01424	30078	28197	55583	05197	47714	68440	22016	79204	06862	94451
43	11601	35302	00271	143	06307	97912	68110	59812	95448	43244	31262	88880	13040	16458	43813	89416	42482	33939
10	88717	37800	00000	144	76285	75714	89585	99296	52640	46518	55486	90754	88932	19937	57119	23251	55619	23679
25	63872	28117	00000	145	55322	07589	39600	60866	63007	20007	66819	84164	61131	81429	60676	42807	78286	29015
39	76536	71255	00000	146	78017	90928	90220	92503	83375	26986	74399	30885	88567	29169	72816	53357	15428	86932
13	18086	47625	00000	147	44768	43342	20696	28331	43140	69744	82928	24988	94237	46138	77428	39039	55596	12655
6	95727	42570	00000	148	25100	19336	14605	86603	51680	97878	24261	02464	86563	74812	60069	71674	15478	47642
5	04378	46270	00000	149	83612	46623	62876	85197	07824	91392	58317	37726	84628	42221	10268	20692	15699	29167
6	51133	25730	00000	150	41347	81666	82961	60413	71020	83658	02415	33322	66036	98712	46795	16308	28413	05417

## **Attachment C**

### **Calculations**

The calculations include

- 1.) Soil Sample Areas, Soil Volumes and Volumetric Percent
- 2.) Available Drums From each Sample Area
- 3.) Drum weight and Maximum number of drums
- 4.) Drum Quantities based on Total Weight of Soil Sample (5000 lbs)
- 5.) Actual Number of Drums Required
- 6.) Borehole length per 30 gal drum of IDM cuttings





## **2.) Available Drums from each Sample Area**

2.) Available Drums from each Sample Area				
<i>Sample Area</i>	<i>Available Representative Drums</i>			
	I	34		
	II	18		
	III	62		
	IV	5		
	V OU-6?	7		
	VI	3		
	Total	129		

### **3.) Drum Weight**

	gal	volume cft	unit soil weight (pcf)	max. drum wt ( lbs)	
30 Gal Drum 100% full	30	4.01	100	401	
30 gal drum 90% full	27	3.61	100	361	
30 gal drum 75% full	22.5	3.01	100	301	

**4.) Drum Quantities based on Total Weight of Sample Required (5000 lbs)**

	max. drum wt ( lbs)	Required Minimum No. of . drums			
30 Gal Drum 100% full	401	12			
30 gal drum 90% full	361	14			
30 gal drum 75% full	301	17			



